Washington State
Integrated Pest Management
Implementation Handbook

Version 2

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Interagency Integrated Pest Management Coordinating Committee

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Overview

Integrated pest management (IPM) has become standard operating procedure in the management of public facilities and lands. As public awareness and concern of human health affects related to pest problems and pesticides has grown, IPM has emerged as the best solution, as an effective method for dealing with pest problems and, when done properly, has been shown to be more cost effective than traditional programs. IPM when done properly, is a more cost-effective approach to pest control when compared to non-IPM control programs and regimes.

Background

In 1997, the Washington State Legislature enacted RCW 17.15, which directed all state agencies and institutions of higher education with pest control responsibilities to practice IPM. Each agency and institution was required to appoint an IPM coordinator to oversee and coordinate its IPM activities. IPM coordinators were also required to be involved in the Interagency Integrated Pest Management Coordinating Committee (IIPMCC), which was given responsibility to ensure that member agency and institution employees would receive integrated pest management training.

During spring, 2000, the Committee undertook the task of creating an implementation handbook for IPM practices which would not only help them as coordinators, but could also be used as a tool to educate staff, faculty and administration on the proper implementation of IPM. There is abundant information on both the philosophy of IPM and specific practices. However, there is very little information on how to actually implement a successful IPM program systematically. The Committee's goal in writing this handbook was to create a tool, which could be used by anyone wanting to implement a successful IPM program.

This handbook will take you through the six steps of implementing IPM and guide you through development of an IPM policy, with tips on writing a statement of intent. The IPM coordinator's duties and responsibilities are outlined, as well as the essentials of a successful IPM program. Included in this handbook are standardized forms for site surveys to aid development and planning of the IPM program. Developing an effective IPM program is facilitated by generalized guidelines for setting tolerance thresholds, establishing preventive measures, cultural practices, and proper sanitation and exclusion situations. Treatment prescriptions for commonly encountered pests are also included in the handbook. Additional standard forms are presented for evaluation of control techniques and results. Tips are provided for developing community awareness and agency staff education.

This handbook was reviewed and contributed to by all Committee members, who lent their expertise and experience for its creation with the goal that no institution or agency would need to re-invent what was already known. Indeed, a vast amount of experience was available, and the Committee ultimately would like to see this handbook expanded to encompass all IPM activities and subsequent success or failures of those activities, making this a living document.

IPM Coordinator

In agencies, colleges, and universities, the IPM coordinator is appointed by the administration. It is important for the administration to appoint an individual familiar with the school's or agency's pest control problems. This person is authorized to make work requests related to pest prevention and control decisions, and participate in the selection and purchase of approved supplies.

The IPM Coordinator or his/her designee will:

1. Coordinate IPM activities to ensure compliance with RCW 17.15.
   a. In conjunction with health/safety and pest control personnel, ensure that federal, state and local pesticide regulations related to label requirements, worker protection measures, record keeping, notification, posting, applicator licensing and hazardous materials storage and disposal are followed.

2. Create management plan(s).
   a. Coordinate pest inspection, identification, monitoring, and usage record retention.
   b. Coordinate development of predetermined pest thresholds requiring remedial action.
   c. Coordinate development of IPM prescriptions specific to each pest, including preventative measures, cultural, physical, mechanical, biological and chemical.
   d. Develop a list of pesticides pre-approved for application by staff and/or outside contractors and written procedures governing their use, based on MSDS's and label requirements. Pesticide use recommendations must be made in writing by licensed personnel.

3. Coordinate IPM Advisory Committee meetings

4. Develop Design Guidelines
   a. Coordinate with planning, design, construction, and maintenance staffs to develop procedures for consideration of pest control implications for new construction, landscaping or remodeling of existing structures.

5. Develop Partnership Guidelines
   a. Coordinate written notification to all pest control, construction, maintenance, and landscape contractors of the need to adhere to the institution/agency IPM program.
   b. Coordinate with custodial, building, and grounds maintenance staff to ensure implementation of pest prevention measures.
   c. Provide oversight and guidance for staff or outside contractors engaged in pest management activities.

6. Conduct Notification
   a. Coordinate with staff and administration to carry out posting and notification.

7. Conduct Program evaluation, record keeping and retention
    a. Coordinate retention of pesticide Material Data Sheets (MSDS), product labels, and, if available, information about inert ingredients.
    b. Coordinate establishment of performance measures and report on progress against baseline with the intent of meeting IPM program goals.
    c. Coordinate retention of all pesticide application records.
    d. Coordinate retention of all cost records associated with the IPM program elements.

8. Conduct Education
    a. Coordinate IPM education and training for staff, faculty and administration
    b. Coordinate development of an IPM awareness program by working with the IPM Advisory Committee and community members, (staff, public citizens, students, faculty) to carry out ideas for community involvement.
    c. Coordinate the development of an IPM resource library.

Develop an IPM policy

This section is intended to inform you about what should be included in an IPM policy. (Italic print represents the sample of the element being discussed.)

A written IPM policy will help explain the school or agency's position on pest management to administration, staff, faculty, students, parents and the public. This policy is also important for private pest control operators who might be under contract to control pest problems at your location. This handbook will help the user develop an IPM policy for his/her school or agency and presents several important parts of an IPM policy and illustrates with examples. The IPM policy should be written by the administration with the appointed IPM coordinator's direct involvement. The IPM policy should be reviewed at least every three years and updated as appropriate.

This handbook also contains the IPM policy that has been developed by Western Washington University. This policy can be used by any institution or agency with few changes needing to be made. The purpose of providing a completed policy in this handbook is two fold. First, it allows the user to go through the descriptions and examples of each section of the policy and then see how it is used in an actual policy. And second, it provides a completed policy to the user to take, adapt to his/her location and present for adoption, making the process of developing a policy less time consuming.

Sample Policy 1 (school)*

Statement of Intent
The policy should start with a statement of intent, which will inform interested individuals of the institution's intent to use an IPM program to control pest problems.

> *Structural and landscape pests can pose significant problems to people, property, and the environment. It is this institution's policy to implement an integrated pest management (IPM) program for control of structural and landscape pests.*

Pests
This section defines "pest" and informs staff, faculty, administration and students what types of organisms will be controlled.

> *Pest means but is not limited to, any insect, rodent, nematode, snail, slug, weed, and any form of plant or animal life or virus, except virus, bacteria, or other microorganisms on or in a living person or other animal or in or on processed food or beverages or pharmaceuticals, which is normally considered to be a pest, or which the director of the Department of Agriculture may declare to be a pest.*

Pest Management Plan
This section establishes the institution's pest management program goals. The goals will also reflect what will be addressed in the pest management plan(s) for various locations (e.g. structural plan, landscape plan, natural area plan, athletic field plan).

Pests will be managed to

- *Reduce any potential human health hazard or to protect against a significant threat to public safety.*
- *Prevent loss or damage to school resources, structures or property.*
- *Prevent pests from spreading into the community, or to plant and animal populations beyond the school site.*
- *Enhance the quality of life for staff, students, the public and others.*

IPM Coordinator
This section briefly defines the IPM Coordinator's responsibilities.

The IPM Coordinator is appointed by the administration and is the sole individual responsible for daily IPM activities, including developing an IPM plan.

Integrated Pest Management
"Integrated pest management" and the elements included in its practice are:

Integrated pest management means a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet institution programmatic pest management objectives. The elements of integrated pest management include:

(a) Preventing pest problems;
(b) Monitoring for presence of pests and pest damage;
(c) Establishing pest populations' density,(which may be set at zero), that can be tolerated or correlated with a damage level sufficient to warrant treatment (or non-treatment) of the problem based on health, public safety, economic, or aesthetic thresholds;
(d) Treating pest problems to reduce populations below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical, and chemical control methods and that must consider human health, ecological impact, feasibility, and cost-effectiveness; and
(e) Evaluating the effects and efficacy of pest treatments.

Education
For an IPM program to be successful, everyone (administration, faculty, and staff) must be aware of the school's policies on pest control and their respective roles in the overall pest management plan.

Staff, students, administration, custodial staff, pest managers, and the public will be educated about potential school pest problems and the integrated pest management

policies and program to be used to achieve the desired pest management objectives. They will also be informed about their role in achieving desired pest management objectives.

Record Keeping

Keeping records of pest sightings and treatments used is required by law and will help identify schools' problem areas and keep track of what, where, when and how pests were controlled. These records can help with periodic evaluation of the pest management plan and aid development of desirable modifications. The IPM coordinator or another designated person will be the main contact person for keeping them.

Records will be kept on the number of pests or other indicators of pest populations both before and after any treatments. Records must be current and accurate if IPM is to work. Records of pesticide use shall be maintained on site to meet WSDA pesticide record keeping requirements. Records will also document any non-chemical treatment methods being used. The objective is to create records from which programs and practices can be evaluated in order to improve the system and to eliminate ineffective and unnecessary treatments.

Notification

For a variety of reasons, some students, staff, faculty and public may want to know when pesticides will be applied at the school. This section of the IPM policy establishes guidelines by which notification will be carried out.

This institution takes the responsibility to notify students, faculty and staff of upcoming treatments that will involve a pesticide. Notice will be posted in designated areas at the institution and made available to anyone by request.

* IPM policy adapted from *Wisconsin's School Integrated Pest Management Manual, School Pilot Program Draft*. The views presented in this policy are examples only and do not necessarily reflect the IIPMCC's views.

IPM Policy for Western Washington University

POL-5750.03 CONTROLLING STRUCTURAL AND LANDSCAPE PESTS

This applies to all state and contract landscape and structural pest management operators in or on all Western Washington University properties.

Western Washington University will Implement an Integrated Pest Management Program

Structural and landscape pests can pose significant problems to people, property, and the environment. It is therefore the intent of Western Washington University to implement an integrated pest management (IPM) program for the control of structural and landscape pests. IPM emphasizes the importance of the environment as a whole by looking at the interdependence of its parts. Thus, the intent of the program is dedicated to removing causes rather than merely treating symptoms.

The Vice President for Business and Financial Affairs will Appoint an IPM Coordinator

The Vice President for Business and Financial Affairs, or his/her designee will appoint an IPM Coordinator. The IPM coordinator will:

- Coordinate daily IPM activities to ensure compliance with RCW 17.15.
- Create management plans:
    1. For pest inspection, identification, monitoring and usage record retention.
    2. For development of predetermined pest thresholds.
    3. Development of control measure continuum specific for each pest.
    4. Development of pre-approved pesticides.
- Coordinate IPM Advisory Committee activities.
- Coordinate with Facilities Management's planning, design, construction and maintenance organizations the design considerations for pest control implications in new construction and building or site modifications.
- Coordinate written notification of IPM operating practices to all workers involved in landscape or structural work.
- Provide oversight and guidance for staff or outside contractors engaged in pest management activities.
- Coordinate IPM notifications to students, faculty, staff and administration.
- Coordinate IPM training of staff, faculty, and administration.
- Represent the University on the Interagency Integrated Pest Management Coordinating Committee.

The Vice President for Business and Financial Affairs will Appoint an IPM Advisory Committee

The Vice President for Business and Financial Affairs, or his/her designee will appoint an IPM Advisory Committee. The IPM Advisory Committee will be composed of people from each of the following functional areas:

- Facilities planning, design and construction
- Grounds maintenance
- Environmental health and safety
- Structural pest management
- Building maintenance
- Student and/or faculty guidance

The IPM Advisory Committee will provide approval for standard IPM operating procedures.

The IPM Advisory Committee will provide a year-end evaluation report for the IPM program.

The IPM Advisory Committee will meet two times a year or more often as needed.

The University will ensure that Students, Faculty and Staff are Notified of Pesticide Treatments

Western Washington University, through implementation of the IPM Program, will ensure that students, faculty and staff are notified of all upcoming treatments that will involve employment of a pesticide. Notices will be posted in designated areas at the institution and made available to anyone upon request.

IPM Coordinator will ensure IPM Records are Maintained and Available

The IPM Coordinator will ensure the keeping of current and quantifiable record of pest numbers or other indicators of pest populations-both before and after treatments. The objective here is to create records from which programs and practices can be evaluated in order to improve the system, as well as eliminate ineffective and unnecessary treatments. The IPM Coordinator shall ensure that records of pesticide use are maintained onsite to meet WSDA pesticide record keeping requirements and document non-chemical treatment methods being used.

The IPM Program will include Pest Management Education and Training

To facilitate a successful integrated pest management program, students, staff, faculty, and administrators shall be informed of potential school pest problems and the integrated pest management polices, as well as the programs used to achieve the desired pest management objectives.

Definitions

Integrated Pest Management (IPM) – means a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner so that the institution's pest management objectives can be accomplished.

Pest – means (but is not limited to) any insect, spider, rodent, mite, tick, fungus, nematode, snail, slug, plant (including "weeds") or any other form of plant or animal life or virus which is normally considered to be a pest, or which the director of the Department of Agriculture may declare to be a pest. Excluded are viruses, bacteria or other microorganisms existing on or in a living person or other kind of animal, or in (or on) items processed for food, beverages or pharmaceuticals.

IPM Program

This section of the Handbook will guide the reader through the process of developing an IPM program starting with the details of an initial site survey, followed by the development of the plan including treatment methods, and finally ending with evaluating the program.

Initial Site Survey

Site surveys are critical to an Integrated Pest Management (IPM) program enabling you to identify and prioritize objectives, compare current results to the objectives, and make decisions about the pest management plan. Washington State's definition of IPM states that IPM is a "coordinated decision-making process". The site survey is where this process begins.

Step 1.
The first step of the site survey is to inventory the site(s). It is usually helpful to separate the site(s) into several different management zones based on management goals. Identify and prioritize objectives for each zone with the major decision-makers, e.g., administrator, principal or director. Realistic budget estimates should be discussed as well, since your IPM plan will be dictated by the agreement between expected objectives and the budget.

> *Example. Grass areas will be separated into zones identified by: fine turf, rough grass, native meadows, or athletic fields. All highly visible landscape areas around the site will be placed in the same zone. The objectives for this zone are high aesthetic value, minimal weeds/pests, therefore requiring more resources.*

Step 2.
Collect baseline data on current pest management practices including: policy implementation and support, responsibility and decision-making process for pest management, history of pest problems and known conditions conducive to pest infestation, and level of staff training. This can be done with the use of a survey questionnaire. (under development)

Step 3.
Onsite inspection. Inspect the site(s) to identify pest problems and their level of impact, and conditions conducive to pest problems that if addressed, will reduce the likelihood of infestations. Also, use this onsite inspection to determine key areas, monitoring frequency and ongoing inspection (see appendix A for landscape and structural monitoring forms). If at the time of inspection, problems or symptoms are encountered with which the practitioner is not familiar, the problem or symptom should be noted and someone with expertise secured to help identify it.

Step 4.
Inspection report. The purpose of the inspection report is to make written recommendations to address the onsite inspection findings. Recommendations should

come in the following forms: long-term solutions; preventive strategies or practices; threshold levels; monitoring and inspection frequencies, and direct management strategies or protocols.

Site surveys should be performed at least annually. Consultants should be used to make sure the process is "information rich" with the most current methods available.

The IPM Plan

The Integrated Pest Management (IPM) Plan provides a holistic approach to pest management composed of short- and long-range pest management strategies involving an integration of prevention, mitigation, education, and direct control techniques. The IPM Plan attempts to incorporate the feasible and practical recommendations from the site survey into practice.

Step 1.
Determine objectives and expectations for each site or management unit. Make sure limitations of existing facilities, landscapes, budgets and manpower are discussed so that expectations are reasonable. The level of pest control and resources needed should be outlined for each site.

Step 2.
Implement long-term solutions such as exclusion of pests from buildings or selecting or replacing existing plants with species that will resist pests or require less maintenance given the horticultural conditions of the site.

Step 3.
Establish ongoing preventive measures such as keeping vegetation trimmed back from buildings, mowing fine turf to a height of two inches, or changing to coarse bark mulch to prevent weed seed growth in landscaped areas.

Step 4.
Determine action thresholds and inspection and monitoring frequency. Based on the expectations for each site determined above, develop an inspection and monitoring program that anticipates potential pest problems. Pinpoint key areas or key plants most likely to have problems or that have a history of chronic pest problems. Along with being the basis for timely pest management decisions, monitoring can also provide information on the presence of beneficial organisms and the effectiveness of preventive measures.

Step 5.
Develop management protocols, prescriptions or best management practices to define specific actions for controlling specific pests. The process for defining action thresholds and for approval of pest management strategies should be outlined (see following example). For common pest problems, materials and methods should be determined in advance in the form of prescriptions. The IPM Coordinator should be familiar with the

materials and methods before approval of pest management strategies. Posting and notification requirements as well as other communication issues should be addressed before starting the pest management strategy.

Process for Determining Pest Management Strategies *(Example)*

The following example outlines the process to follow when addressing pest problems and will guide you through the process and tie it in with the form that is included. It is important to remember that the treatment methods are not simply IPM prescriptions used for dealing with pest problems, but also procedures used to address pest problems. This process should not only be followed by staff but by outside vendors as well.

Step 1. Pre-action inspection. Thorough inspections are performed for all reported pest problems before a management strategy is begun. Inspections determine the actual presence and identity of pest species, levels of threat to health or property, the source of the problem and conditions conducive to further infestations or problems. This is the point at which the IPM practitioner determines if thresholds have been exceeded or not. Inspection should also be used to determine other factors that will influence control strategies, such as safety concerns or the presence of beneficial organisms. Unlike the initial inspection and regular monitoring, the pre-action inspection is an in-depth inspection of specific problems. Once regular monitoring determines a possible pest problem may exist, then the pre-action inspection is conducted for the specific pest problem only. During the pre-action inspection, the IPM technician should use the IPM Management Strategy Report (included) to record existing problems.

Step 2. Action recommendations. After the pre-action inspection is completed, a completed management strategy report (Fig. 1) is provided for the IPM Coordinator's approval. When completing the Management Strategy Report, include the following action recommendations and expected outcome using each method.

First Action Recommendation: Exclusion or access denial. In this space, record the exclusion or access denial problems that exist, recommended procedures for correcting them, and other recommendations for preventing the pest from entering the site.

Second Action Recommendation: Habitat and harborage. Record habitat and harborage problems that exist and procedures for modifying these problems, e.g.: depriving pest food sources and nesting areas, or in landscape areas, plants receiving too much or too little light.

Third Action Recommendation: Physical, mechanical, and chemical control. Record all control methods that could be used to control the pest

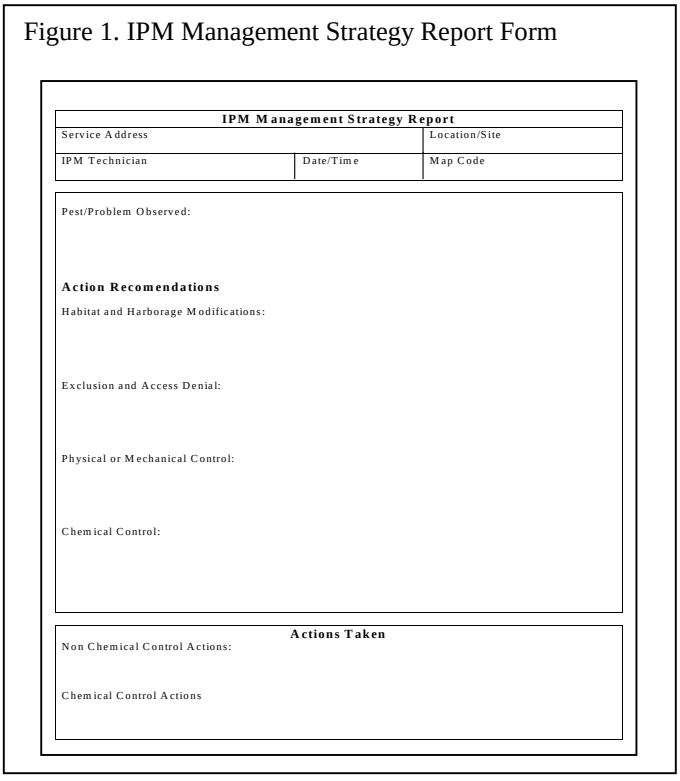
problem. Recommend the most appropriate method. The appropriateness of the methods is compared by weighing efficacy, and environmental and economic concerns of each method. Pesticide application use recommendations must be made by properly licensed pesticide applicators.

Before completing the report, be sure to include a recommended monitoring schedule for each action recommendation.

Step 3. Identify and carry out the management strategy action(s) according to the approved recommendations. Make sure that the procedures specified in the IPM policy are properly addressed and that the approved pest management strategy is completely carried out. Remember that true IPM warrants consideration of at least two of the four recommendation levels. Remember to record the actions taken on the Management Strategy Report.

Step 4. Evaluation of controls. Records must be kept for all activities including chemical, physical, cultural and mechanical; this is why all actions taken need to be recorded on the Management Strategy Report form. These records will be used to evaluate results and to create a history for anticipating future pest management solutions. These report forms are not only important for recommending action, but also for showing the IPM plan's success.

Figure 1. IPM Management Strategy Report Form



IPM Management Strategy Report

Service Address		Location/Site
IPM Technician	Date/Time	Map Code

Pest/Problem Observed:

Action Recomendations

Habitat and Harborage Modifications:

Exclusion and Access Denial:

Physical or Mechanical Control:

Chemical Control:

Actions Taken

Non Chemical Control Actions:

Chemical Control Actions

Proper Program Evaluation

Evaluation is one of the essential elements needed to ensure the success of the IPM program. It is important to keep good records of all IPM activities including monitoring, preventive measures and IPM prescriptions used. This will allow coordinators and IPM practitioners to evaluate what has been working and what has not. With this information in hand, the IPM plan can be easily modified to address deficiencies.

Record Keeping

A. IPM Coordinator Components
   1) Recommendations and approvals
      - Date
      - Item

B. Actions
   1) Prevention
      - Short term
      - Long term
   2) Habitat Modification
      - Short term
      - Long term
   3) Physical/mechanical control actions
      - Short term
      - Long term
   4) Chemical Control
      - Short term
      - Long term

C. Monitoring

D. Plan/ program modifications
   - Date
   - Change

1. Management Results
   A. Date of action
   B. Action utilized
   C. Post action populations
   D. Opinions on results
      1) Management
      2) Field crews
      3) Users/occupants

Public Education

Public posting of pesticide applications is required by law. Education of the clientele through the resource library, sample specimen collections, pest prescription availability and management strategy reports are useful to understanding an integrated pest management program. It is also important to make evaluation and expectation forms available to clientele for performance feedback.

Section under development

Appendix A: Program Forms

1. Baseline Data form (under development)
2. Landscape monitoring form
3. General insect/vertebrate monitoring form
4. Management strategy report
5. Program evaluation form (under development)

Baseline Data Form

Under Development

(2)

Landscape Monitoring Form

Location: Observer's Name:

Name of Plant
Common name:_____Scientific name:_____

Growth stage:_____

Pests observed: Yes No
Common name_____Scientific name:_____

Growth stage_____

Beneficials observed: Yes No
Common name:_____Scientific name:_____

Growth stage:_____

Amount of plant damage:

Weather conditions:
Temp:
Wind:
Precipitation:

Human behavior affecting plant:

Cultural factors affecting plant:

Management Activities:

(3)

General Insect/Vertebrate Monitoring Form (Structural)

Location: Name:

Pests observed: Yes No

Common name_____Scientific name:_____

Growth stage_____

Density (number)_____

Evidence of infestation:
Damage Observed (see map):

Action threshold:

CONDUCIVE CONDITIONS:
Food:

Harborage:

Moisture:

Openings:

MANAGEMENT STRATEGIES:
Exclusion/Access Denial:

Habitat/Harborage Modification:

Non-chemical Strategy:

Chemical Strategy:

IPM Management Strategy Report

Service Address		Location/Site
IPM Technician	Date/Time	Map Code

Pest/Problem Observed:

Action Recomendations

Habitat and Harborage Modifications:

Exclusion and Access Denial:

Physical or Mechanical Control:

Chemical Control:

Actions Taken

Non-Chemical Control Actions:

Chemical Control Actions:

Program Evaluation Form

Under Development